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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/622,931	11/13/2000	Yoshiki Nakagawa	1581/00210	5489

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EXAMINER

ZALUKAEVA, TATYANA

ART UNIT	PAPER NUMBER
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1713

DATE MAILED: 02/09/2004

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

09/622,931

Applicant(s)

NAKAGAWA ET AL.

Examiner

Tatyana Zalukaeva

Art Unit

1713

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 04 December 2003.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-3,5,8-10,12-17 and 19-34 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-3,5,8-10,12-17 and 19-34 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. §§ 119 and 120

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
* See the attached detailed Office action for a list of the certified copies not received.
- 13) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application) since a specific reference was included in the first sentence of the specification or in an Application Data Sheet. 37 CFR 1.78.
a) ☐ The translation of the foreign language provisional application has been received.
- 14) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121 since a specific reference was included in the first sentence of the specification or in an Application Data Sheet. 37 CFR 1.78.

Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892) 4) ☐ Interview Summary (PTO-413) Paper No(s). _____
- 2) ☐ Notice of Draftperson's Patent Drawing Review (PTO-948) 5) ☐ Notice of Informal Patent Application (PTO-152)
- 3) ☐ Information Disclosure Statement(s) (PTO-1449) Paper No(s) _____ 6) ☐ Other: _____

DETAILED ACTION

Continued Examination Under 37 CFR 1.114

1. A request for continued examination under 37 CFR 1.114, including the fee set forth in 37 CFR 1.17(e), was filed in this application after final rejection. Since this application is eligible for continued examination under 37 CFR 1.114, and the fee set forth in 37 CFR 1.17(e) has been timely paid, the finality of the previous Office action has been withdrawn pursuant to 37 CFR 1.114. Applicant's submission filed on 12/04/2003 has been entered.
2. Claims 4, 6, 7, 11, 18 are cancelled by the present amendment.
3. Claims 1-3, 5, 8-10, 12-17, 19-34 are pending.
4. The text of those sections of Title 35, U.S. Code not included in this action can be found in a prior Office action.
5. Claims 1-3, 5, 13-20, 22, 23, and 34 are rejected under 35 U.S.C. 102(b) as being anticipated by or in the alternative as obvious over Randen et al (U.S. 5,604,268).

Randen discloses an adhesive composition comprising functionally reactive macromers, which are prepared from the corresponding **telechelic prepolymers** of, for example, octadecyl acrylate (ODA), behenyl acrylate (BeA) and mixtures of tetradecyl acrylate (TDA), and a variety of other acrylates and acrylic esters, all prepared by living polymerization. (col. 5, lines 46-55).

Macromers with calculated molecular weights of 2500, 5000, 11,000 and 20,000 g/mole for ODA and macromers of BeA with calculated molecular weights of 4500 and

11,000 have been prepared (col. 5, lines 58-65). The hydroxyterminated telechelic polymers were then functionalized with acryloyl chloride(ACI), methacryloyl chloride(MACI), 2'-isocyanatoethyl methacrylate(IEM), 3-isopropenyl-alpha, alpha-dimethylbenzyl isocyanate(IPDMBI) and the like. (col. 13, lines 1-14)

ODA hydroxy-terminated telechelic prepolymers with calculated molecular weights of approximately 2500, 5000, 7500 and 20,000 g/mole were prepared by living radical polymerization and are shown in Table 3. Examples 24-30 demonstrated telechelic polymers with varying amounts of ODA homopolymer therein.

As noted above the claims are product-by-process claims, and in terms of the PRODUCT, the references meet the limitations of the instantly amended claims.

Each one of the cited references discloses an acryloyl group end-functional or telechelic vinyl polymers, and provide different chemical reactions describing functionalization of polymers in order to achieve the desired end-functionality.

6. Since the polymers of Randen are essentially the same as the instantly claimed polymer, and are prepared by essentially the same process, it is believed that the properties governing these polymers are within the claimed range, as per *In re Fitzgerald*.

With regard to claim 12 there is no evidence, or no reason to believe that the process of functionalization as instantly claimed in claim 12 produces a different product, than that that of Randen, consult *In re Thorpe*, 227 USPQ 964 (CAFC 1985).

Art Unit: 1713

7. Claims 6, 8-10, 21, 30-34 are rejected under 35 U.S.C. 103(a) as being unpatentable over Matyaszewski (U.S. 5,807,937) alone or over Randen in combination with Matyaszewski.

Matyaszewski discloses a method of atom transfer radical polymerization (ATRP), as a kind of a living polymerization process in particular application to the process of making end functional and telechelic polymers (see abstract, figure 1, col.25, lines 31-35, col. 26, lines 5-56, etc.) Matyaszewski discloses a variety of suitable polymers, including acrylates, methacrylates, styrene and other vinyl polymers, terminated by a variety of functional groups, including acryloyl groups, as can be derived from the meaning of X explained through the whole body of a patent). The range of molecular weights and molecular weight distributions of Matyaszewski's end-functional and telechelic polymers are within the instantly claimed range (see, for example col. 26, lines 44-56)..Metal complex catalyst utilized by Matyaszewski is preferably a copper complex. The end functionality of the copolymers of Matyaszewski an be easily converted to other functional groups, including acryloyl groups by any conventional and known methods (col. 39, lines15-25). Polymers can be prepared using water as a medium, utilizing an emulsion polymerization (col. 39, lines 43, 44).

Since both Matyaszewski and Randen teach the living radical polymerization of vinyl compounds terminated by acryloyl groups, and since Matyaszewski provides detailed description and mechanism of ATRP, one skilled in the art would have found it

Art Unit: 1713

obvious to utilize the specificities of Matyaszewski in a living process of Randen in order to achieve the advantages of ATRP, such as controllable molecular weight and narrow molecular weight distribution.

8. Claims 19, 24-32 stand rejected under 35 U.S.C. 103(a) as being unpatentable over any one Randen or Matyaszewski (each one individually) in view of Fifield (U.S. 5,381,735).

Randen and Matyaszewski all disclose acryloyl group end functional vinyl polymers, which are components for curable compositions. However, the above references do not specify photocuring by means of actinic rays or photopolymerization initiators.

Actinic radiation and photoinitiators are well known to those skilled in the art for curing polymeric compositions.

Thus Fifield discloses photopolymerizable composition comprises a photopolymerizable material having ethylenically unsaturated bonds available for participation in addition (free radical) polymerization. Prepolymers, of Fifield are those having olefinic bonds at the termini of the chain are subsequently further polymerized by use of **actinic radiation**. (col.4, lines 24-35)

The termini of the prepolymer chain are typically "capped" via an ester or carbamoyl (urethane) linkage with an olefinic moiety such as an acrylate or methacrylate. (col. 4, lines 43-46). The composition can be also thermally cured with the use of thermal initiators (col. 7, lines 45-50).

Since Randen or Matyaszeewski suggest curing or crosslinking a composition comprising a polymer having terminal functional group, and Fifield specifies the details of curing process for the similar compositions one skilled in the art would have reasonably expect that the conventionally known techniques of photopolymerization are operable within the scope of Randen or Matyaszeewski inventions with the reasonable expectation of success.

Therefore, the combination of references renders the above claims prima facie obvious and properly rejected under 35 USC 103(a).

Response to Arguments

9. Applicant's arguments with respect to JP'720 and Kennedy have been considered but are moot in view of the new ground(s) of rejection.

10. Applicant's arguments filed 12/04/2003 have been fully considered but they are not persuasive.

With regard to Randen reference Applicants arguments reside in contention that all the polymers of Randen are obtained in the presence of a chain transfer agent, and therefore cannot have narrow polydispersity as instantly claimed, and Applicants refer to their specification, wherein the general statement is made that The "chain transfer method" enables production of a polymer of high functionality but it requires the use of a chain transfer agent having a defined functional group in a fairly large amount and this requirement coupled with the disadvantage in after-treatment makes the method

Art Unit: 1713

economically unfavorable. Another disadvantage is that since the reaction involved is a free-radical polymerization like said "standard radical polymerization", only a polymer having a broad molecular weight distribution and a high viscosity can be obtained.

In response to this it is noted that only in specific examples the use of a chain transfer agent is disclosed, wherein the general teaching does not make the selection of a chain transfer agent mandatory. Furthermore, several references are presented along with the present communication showing that the presence and/or increased amount of a chain transfer agent in fact narrows the molecular weight distribution:

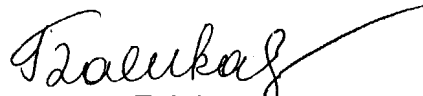
U.S. 5,455,315, col.11, lines 20-32, especially col.12, lines 59-62; U.S. 4,533,482 col. 19, lines 63-67; , and especially U.S. 4,593, 081 that shows the use of t-dodecyl meracptan chain transfer agent can reduce the polydispersity of polymers to up to 1.48. (col.9, lines 36-44, col.10, lines 1-8). Therefore, since Applicants have not presented a valid side-by-side comparison between their molecular weight distribution and that disclosed by Ramden , wherein the only difference is the presence of a chain transfer agent, as per In re Dunn, 349 F. 2d 433, 146 USPQ 489 (CCPA 1965), the rejection over Randen is proper.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Tatyana Zalukaeva whose telephone number is (571) 272-1115. The examiner can normally be reached on 9:00 - 5:30.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, David Wu can be reached on (571) 272-1116. The fax phone number for the organization where this application or proceeding is assigned is (703) 872-9306.

Art Unit: 1713

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is (571) 272-1700.



Tatyana Zalukaeva
Primary Examiner
Art Unit 1713

January 28, 2004